

# AUTOMATIC GAIN CONTROL FOR A CONFOCAL IMAGING SYSTEM

## Abstract

Automatic gain control is provided for a confocal imaging system to improve the quality  
5 of images produced by the system. The confocal imaging system utilizes an illumination source,  
such as a laser, to produce illumination which enables imaging of an object. The automatic gain  
control is provided by an automatic gain controller which receives a raster scan video of two-  
dimensional frames of images from the confocal imaging system, converts the raster scan video  
into pixels, where each pixel has a brightness value, and then counts, in each frame, the number  
10 of pixels which are too bright, the number of pixels which are too dim, and the total number of  
pixels. After each frame is received, the laser of the confocal imaging system is controlled in  
accordance with signal(s) produced by the automatic gain controller, whereby the power to the  
illumination source is reduced when the number of pixels too bright exceeds a number  
representing a first percentage of the total pixels of the frame, and the number of pixels too dim  
15 is greater than a number representing a second percentage of the total pixels of the frame, and the  
power of the illumination source is increased when the number of pixels too dim is less than the  
number representing the second percentage of the total pixels of the frame, and the number of  
pixels too bright in the image is less than the number representing the first percentage of the total  
pixels of the frame. The automatic gain controller may be operative over either the entire frame  
20 of the image, or a rectangular region in the image.